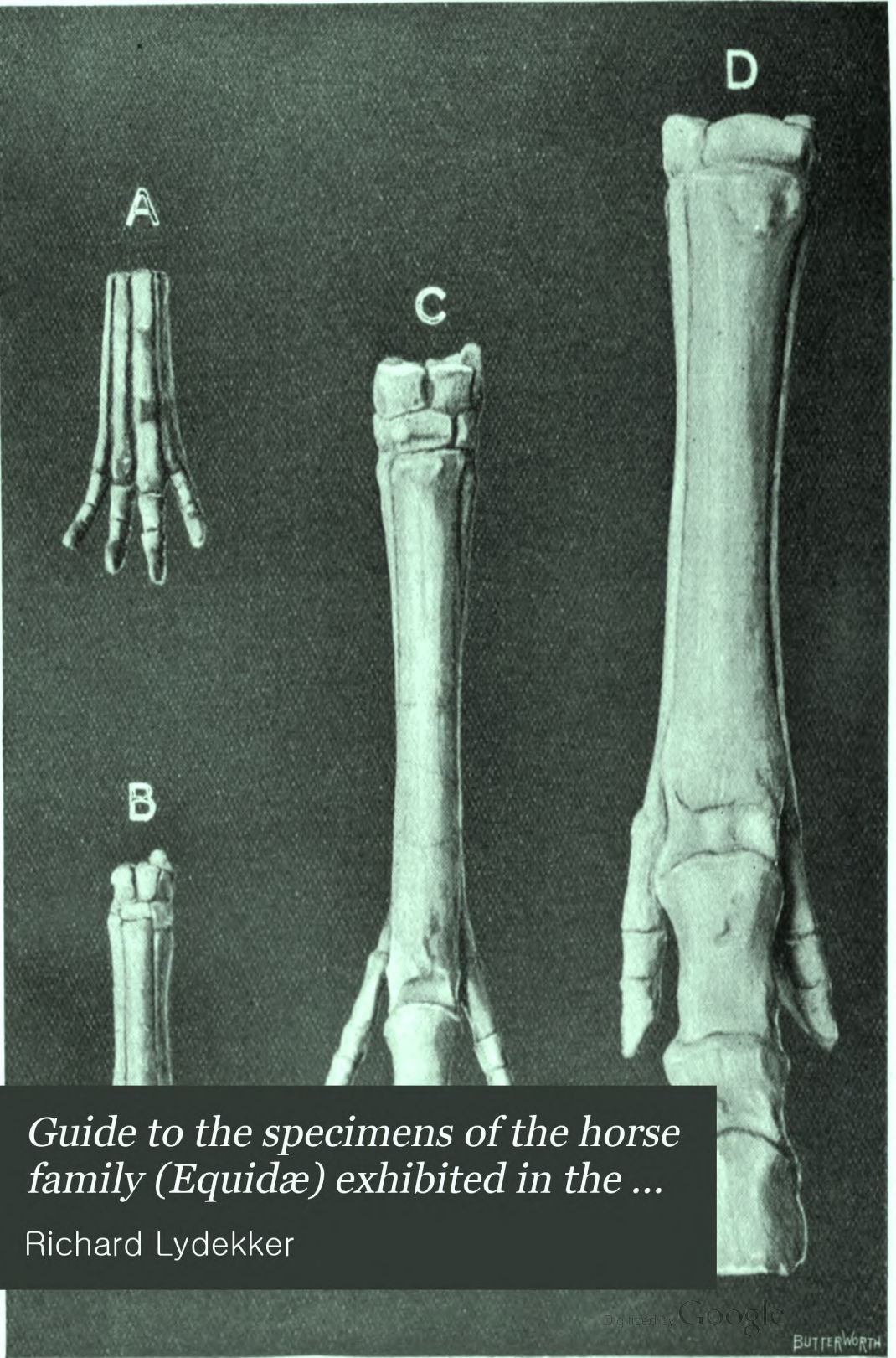

Guide to the specimens of the horse family (Equidæ) exhibited in the ...

Richard Lydekker

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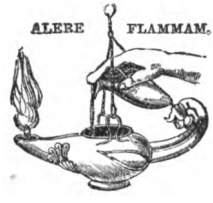
BUTTERWORTH



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GUIDE

TO

THE HORSE FAMILY.

—o—

The name "Horse."

ALTHOUGH frequently employed in zoology in a wide sense, to indicate all the members of the family *Equidæ*, both living and extinct, the term "Horse" properly denotes only the well-known domesticated animal *Equus caballus* and its half-wild or wild representatives. Since, moreover, the Latin name was given by the Swedish naturalist Linnæus, it seems necessary to regard the domesticated Horses of Scandinavia as the typical representatives of the species.

In these pages the term Horse is mainly used in the more restricted sense.

Different views are entertained with regard to the limitations of the family *Equidæ*, some naturalists including in it all the extinct animals belonging to the same line of descent, or "phylum," while others restrict it to those more or less nearly related to the living species.

The Horse Family.

In the latter sense the *Equidæ* are characterized by the tall prismatic crowns and complex structure of their cheek-teeth, in which all the hollows and valleys formed by the infoldings of enamel are filled by cement, so as to form a grinding surface of a perfect type. Another feature is the presence of an infolding of the enamel in the summits of the incisors, thus producing what is called the "mark." In the skull

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the lateral toes being represented only by the so-called "splint-bones" (fig. 7).

Remains of Horses indistinguishable from some of the various forms of the existing species occur in the superficial deposits of Europe and Asia, in company with those of the Mammoth. At a somewhat earlier epoch (Pliocene) occur Horses, such as *E. stenonis* of Europe and *E. sivalensis* of India, in which the head is relatively larger, the feet are somewhat smaller, the splint-bones more developed, and the skull shows traces of a depression in front of the eye. The American *Pliohippus* is smaller, with shorter cheek-teeth. Still earlier (Miocene) is found in America a Horse known as *Merychippus* or *Protohippus* in which the splint-bones are fully developed and terminate inferiorly in small, although perfect, toes. In the early Pliocene *Hipparion*, or three-toed Horse, the lateral toes are still larger, while the crowns of the cheek-teeth are lower, and the skull is shorter and shows a large depression in front of the eye. In this animal the crowns of the cheek-teeth are still tall and have their hollows filled with cement (fig. 6, E), and there must consequently be some unknown forms connecting it with the Miocene *Anchitherium*, in which the crowns of these teeth are quite short, and have their hollows free from cement. *Hipparion* is generally regarded as off the direct ancestral line.

This type is common to Europe, Asia, and North America; but Mr. J. W. Gidley, in the *Bulletin* of the American Museum, has come to the conclusion that the New World Hipparions are generically distinct, and proposes that they should be known as *Neohipparion*. They differ from the Old World forms by certain details of tooth-structure, as well as by their more slender limbs, in which it seems that the lateral toes are relatively smaller. Finally, they are of Miocene, instead of Pliocene, age.

Nearly allied to *Anchitherium* is the Oligocene genus *Mesohippus*, the species of which are smaller than the typical representative of the former. In these animals the socket of the eye is open behind, the gap between the canine and cheek-teeth is comparatively short, the lateral toes are functional, and there is even a suggestion of a fourth toe in the fore-foot (fig. 2, B). This digit is fully developed in the fore-foot (fig. 2, A) of *Hyracotherium*, a Lower

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Eocene Mammal not larger than a Fox, in which the lateral digits of both feet are relatively as large as in the Tapir, while all the bones of the feet are proportionately shorter than in the Horse, and all three joints of each toe probably touched the ground. Species intermediate between *Mesohippus* and *Hyracotherium* have been named *Plagiolophus* and *Orohippus*. Farther it is not at present possible to carry the ancestry of the Horse, but there is little doubt that *Hyracotherium* is descended from a still earlier five-toed Mammal with a simpler type of cheek-teeth, and much shorter foot-bones. This hypothetical animal doubtless walked on the whole sole of its foot (plantigrade progression) instead of on the tips of the toes, and was probably nearly related to the creature known as *Phenacodus*, a cast of the skeleton of which is exhibited in the Gallery of Fossil Mammals. For further details concerning the extinct allies of the Horse see 'A Guide to the Fossil Mammals and Birds in the Department of Geology and Palæontology'.

South American Extinct Horses. The superficial (Pleistocene) deposits of South America—more especially those of the province of Buenos Aires—have yielded remains of two very remarkable equine animals, *Hippidium neogæum* and *Onohippidium munizi*. Of the former the model* of a nearly entire skeleton (N.H. **3**, fig. 3) is exhibited, while the latter is represented by a cast of the skull (N.H. **17**). In both genera the cheek-teeth (as mentioned later) have shorter crowns and differ in several details of structure from those of modern Horses. As mounted, the skeleton stands 4 ft. 1 in., or 12¼ hands, at the withers, while the skull measures 23½ in. in total length. In an average European horse-skeleton, standing 4 ft. 9½ in., or 14 hands 1¼ in. at the shoulder, the skull-length is about 23¾ in., or practically the same as in the much smaller *Hippidium*. Although these measurements suffice to show how disproportionately large is the skull of the *Hippidium*, they by no means indicate the chief peculiarities of that animal. Comparison of the skull of the former with that of an ordinary Horse shows a most remarkable difference in the structure of the nasal region of the two species. In the ordinary Horse the nasal bones are separated from the maxillæ, or upper jaw-bones, of either side by a slit of only some

* The original of this model has been made the type of a second species, but on very slight grounds.

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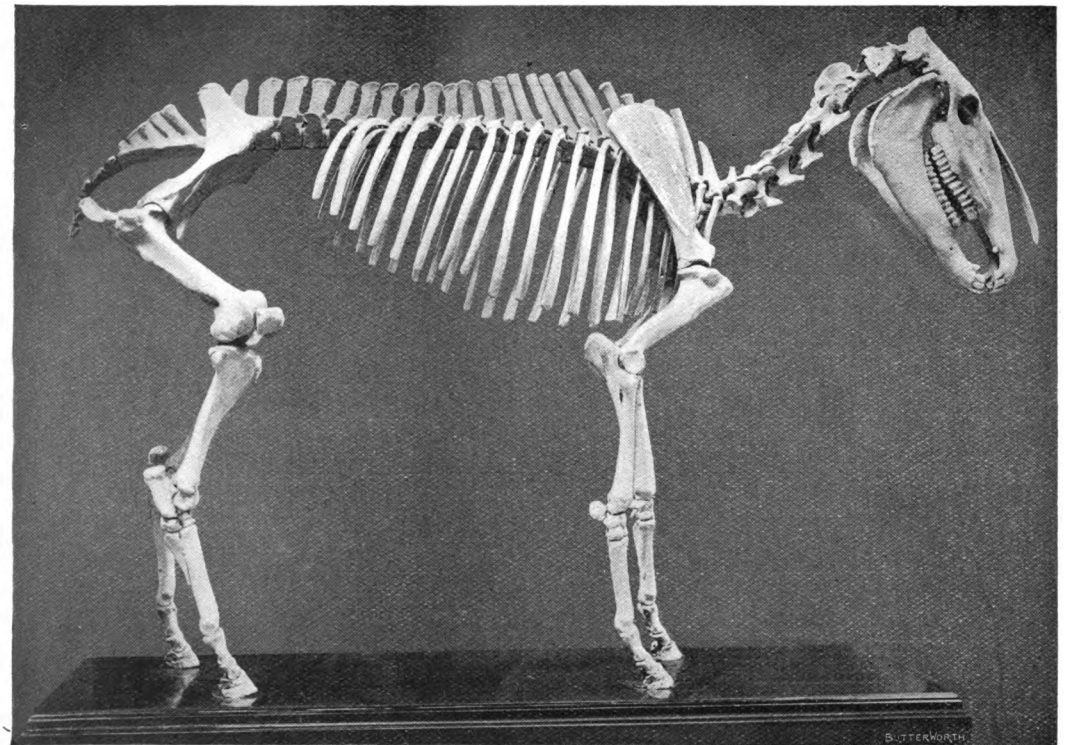
FIG. 3.



SKELETON OF *Hippidium neogæum*, about $\frac{1}{14}$ nat. size.
(From the model in the Museum (No. N. H. 3); the femur, or thigh-bone, is too much inclined.)

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three or four inches in length. In *Hippidium* (as in *Onohippidium*, fig. 4), on the other hand, these slits are about 10½ in. long, while the nasal bones themselves are proportionately long and slender. This clearly indicates that these extinct American Horses had extremely elongated noses, not improbably forming a kind of short trunk comparable to that of the Saiga Antelope.

In that animal, as well as in its relative the Chiru Antelope of Tibet, the increased size of the nasal chamber has been brought about by a shortening instead of an elongation of the nasal bones, but it is probable that in these two Antelopes and in the *Hippidium* the purpose of the modification is the same. It has been generally supposed that in the case of the Chiru the large size of the nasal chamber is an adaptation to the respiratory needs of an animal living at a very high elevation. In the case of the Saiga such an explanation would, however, obviously not hold good; and the real explanation in all three cases may perhaps be found in a special adaptation to a desert life, the long nose serving as a filter to prevent particles of sand reaching the organ of smell.

As regards the rest of its skeleton, *Hippidium* is remarkable for its short and stout limbs; this being chiefly due to the excessive shortness of the cannon-bones, which are also unusually wide, with very stout splint-bones. Each limb terminates in a single toe. These short limbs, coupled with the huge unwieldy head, indicate that *Hippidium* had less speed than ordinary ponies. There are only five lumbar, or ribless trunk, vertebræ, as in the Arabian Horse.

Two other points of interest in connection with these peculiar equine animals deserve brief reference. From the conformation of the bones of the nasal region it seems certain that neither *Hippidium* or *Onohippidium* can be derivatives from the genus *Equus*, while it is still more evident that *Equus* cannot be descended from *Hippidium*. Consequently, the reduction of the digits from three in the ancestral Horses to a single one on each foot has taken place independently in the two genera. The second point is that if the wild Horses alleged to have been seen by Cabot in Argentina in the year 1530 really were, as some suppose, indigenous, they must have been either *Hippidium* or *Onohippidium*, and not Horses of the Old World type. With the evidence afforded by the skins of the Patagonian Ground-Sloth as to the

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comparatively late date to which that species survived, there is no valid reason why *Hippidium* and *Onohippidium* should not have survived till Cabot's time, especially as their hoofs have been found in comparatively fresh condition alongside the remains of the Ground-Sloth.

While the skull of *Hippidium* shows no marked depression in front of the eye-socket, that of *Onohippidium* (fig. 4) has an enormous pit in this position, with a smaller and partially detached one in front.

Teeth of Extinct Horses. In the same case with the skull of *Onohippidium* are exhibited a few specimens (N.H. **34**) illustrating the structural differences in the upper cheek-teeth of some of the later members of the *Equidæ*, and also the marked difference between an unworn and a worn molar of *Equus caballus*. The specimen marked A (fig. 6, A) is an unworn molar tooth of the latter species, with the infoldings of the crown not yet filled with the cement, which is developed later. D (fig. 6, D) shows the condition of a similar tooth which has been some time in use. The summits of the columns coloured red in A have been worn away in D so as to expose the dentine or ivory (red) forming the interior of the tooth; the infoldings on the crown, of which the central ones are converted into islets, being filled with cement (blue). The enamel, forming the proper external surface of the tooth, is left of the natural colour. Specimen C (fig. 6, C) is a half-worn tooth of the above-mentioned extinct South American *Hippidium*, in which the two disks (anterior and posterior pillars) on the lower border coloured red are more alike than in *Equus*; the whole crown of the tooth being also shorter. Specimens B and E are respectively slightly worn and half-worn teeth (fig. 6, B & E) of the European Three-toed *Hipparion*. In these the anterior pillar (*a*) is isolated from the rest of the crown, thus indicating that the genus is off the direct line of ancestry of the modern representatives of the Horse family.

Callosities or "Chestnuts." Although it is unnecessary to discuss the general structure of the *Equidæ*, it is important to mention that all members of the Horse tribe have a bare patch of hardened skin on the inner side of the fore-leg, situated some distance above the carpus, or "knee." In the Horse a similar but smaller callosity, or "chestnut" generally

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occurs on the inner side of the hind-limb some distance below the tarsus, or hock (fig. 8). This hind-callosity is absent in certain ponies from Iceland and the Hebrides as well as, it is reported, in some horses from North Africa; and is always wanting in the Ass, the Zebras, and all other members of the family. The front callosity is more warty in the Horse than in any other species of the family.

These structures are evidently of the type commonly called rudimentary, that is to say, they are the decadent remnants of organs once functional. They have been regarded as representing glands. Important evidence in favour of this view is the fact that when cut the callosities yield a fluid which will attract other horses, and will likewise cause dogs to keep quiet when the premises of their masters are invaded; such a fluid being almost certainly derived from an ancestral scent-gland.

Specimens of the legs of the Horse (N.H. **71**, **72**), Ass (N.H. **69**, **70**), and Zebra (N.H. **68**) are exhibited in the large case in the central archway on the north side of the hall to illustrate these remarkable structures. Near by are shown in spirit portions of the hind-legs of two unborn colts (N.H. **96**, **96** A) in order to demonstrate that the position of the calosity (fig. 9) is the same as in the adult, and thus to refute the suggestion that these structures represent one of the foot-pads of less specialized Mammals.

In the same case are displayed specimens of the limbs of Deer with glands situated in positions not very dissimilar to those occupied by the callosities of the Horse.

In old veterinary books the callosities, which were supposed to be due to disease, are called sallenders (from the French *Solandre*), or mallenders. They are sometimes called "castors."

The Ergot. The true representative of a foot-pad is the "ergot," or small horny knob projecting from the hind surface of the fetlock of the Horse. A specimen (N.H. **93**, fig. 10) showing this is displayed in the same case, where the foot of a Tapir (N.H. **94**, fig. 11, A) and another of a Dog (N.H. **95**, fig. 11, B) are also exhibited, in order to show the correspondence of the central pad with the Horse's ergot.

"Horned Horses." In this place certain interesting abnormalities which occasionally make their appearance in Horses may be conveniently noticed. The most remarkably of these are connected with the skull. The specimens exhibited include

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the skull of an English Horse (N.H. **45**) presented by Mr. Hanbury Carlile, showing rudiments of a pair of horns on the forehead. Of three other specimens of the same type, one is the frontal region of the skull of an ordinary English Horse (N.H. **44**) showing the pair of rudimentary horns in precisely the same position as in the first specimen, but of somewhat larger size. The other two are models of the foreheads of Thoroughbreds (N.H. **46**, **47**), each showing a pair of similar horns, situated as in the preceding specimens. These are important as showing that the skin extends uniformly over the horn-like processes, without any trace of a dermal horn; the same condition being observable in the other two examples. The significance of these horn-like growths is at present inexplicable, seeing that none of the ancestral Horses, or even of the collateral branches of the Horse-stock, were horned animals. This makes it the more difficult to understand why the projections in all the four specimens above referred to should be so similar in form and position.

Bones of the Foot. The next abnormalities to be mentioned are connected with the foot-bones of Shire Horses, as represented in the feet of "Blaisdon Conqueror," formerly owned by Mr. Peter Stubs and of two other Horses of the same breed presented respectively by Lord Wantage and Lady Wantage. In the skeleton of "Prince Henry," presented by Lady Wantage, only the bones of the limbs on the left side (N.H. **38**) have been preserved; but in both the front and hind cannon-bones (fig. 7) of that side the two lateral splint-bones (the metapodials of anatomists) are unusually large and stout. In place of terminating, as in many ordinary Horses, about two-thirds down the shaft of the cannon-bone, or even less, in thin narrow slips, they extend fully four-fifths the length of the latter, where they end in large triangular processes inclined markedly outwards. Although these terminal projections are immovably welded to the splint-bones, their structure is such as to indicate that they represent distinct elements, consisting of two or three pieces each; and there can be no doubt that they really correspond to the lateral toe-bones (phalanges) of the extinct Hipparion. In other words, Lady Wantage's Shire may be said to be a veritable three-toed Horse,

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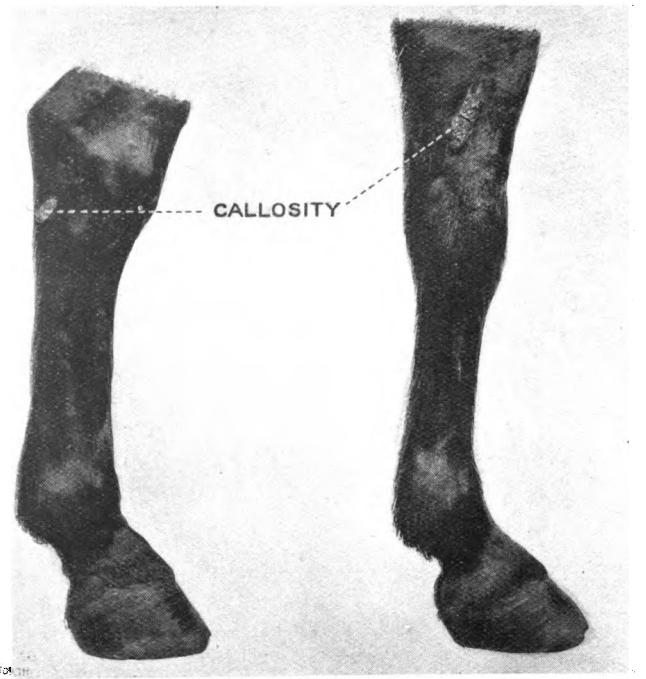
FIG. 8.



THE CALLOSITIES ON THE FORE- (**A.**) & HIND- (**B.**) LEGS OF THE HORSE (Nos. N. H. 71, 72).

(From specimens in the Museum.)

FIG. 9.

THE CALLOSITY ON THE FORE-LEG OF AN UNBORN COLT (No. N. H. 86).

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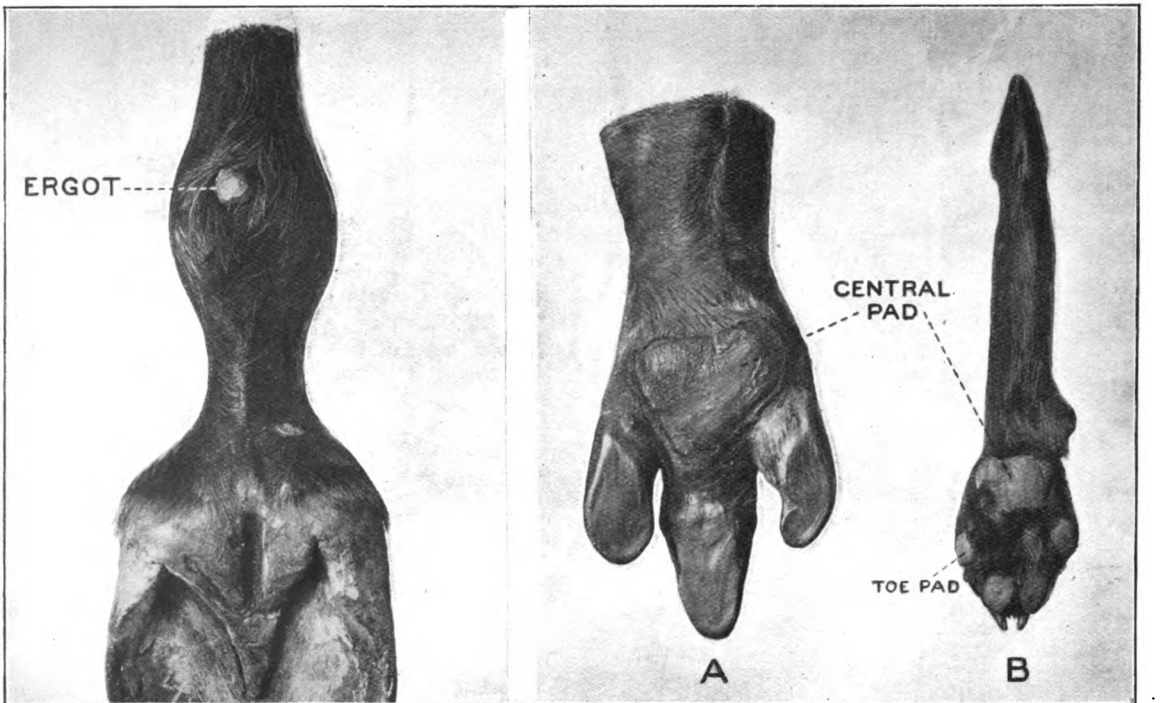
Fig. 10.

Fig. 11.



Horse.

Hind surface of the Foot of a Horse, to show the ergot (No. N. H. 93).

Tapir. Dog.

Fore-feet of a Tapir (A), and a Dog (B), to show the pad corresponding with the ergot of the Horse (Nos. N. H. 94 & 95).

[To face page 11.

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in which the bones of the rudimentary lateral toes were buried in the skin and welded together. It is noticeable that, in both the fore and hind foot, the outer rudimentary toe-bones are much more developed on the left than on the opposite side.

If this were all, it might be considered that the Shire "Prince Henry" was merely a solitary instance of reversion towards the ancestral type in foot-structure, and, although even this would be a matter of considerable interest, yet it would have little or no special bearing on the ancestry of the breed in general. Since, however, the cannon-bones of "Blaisdon Conqueror" also display an equally large development of the splint-bones, which show traces at their lower ends of distinct vestiges of the toe-bones, although by no means in so pronounced a degree as in "Prince Henry," the peculiarity seems to be more deeply seated. It is true, indeed, that in the case of the feet (N.H. **77**, **78**) and limb-bones (N.H. **79**, **80**) of a Shire colt presented by Lord Wantage, it has to be admitted that these are abnormal and more or less malformed; yet, the fact remains that they show not only traces, but a relatively high degree of development of the lateral toes, of which the constituent bones are separate, while the terminal one on one side of each limb has a hoof of its own. The reversion to the ancestral type is thus very strong. In both feet of this colt the lateral (2nd and 4th) metacarpal bones (usually represented only by the so-called splint-bones) are complete, though varying in size, and carry one toe-bone each.

Although this abnormal specimen was selected and presented to the museum on account of its peculiarities, yet, after making allowance for this, there is the remarkable fact that three skeletons of Shire Horses exhibit more or less strongly developed rudiments of the lateral toes of the extinct three-toed Hipparion. The obvious inference is that this is a characteristic of the breed.

To confirm or disprove this idea requires, however, the limb-bones of a considerable series of pedigree Shires. Of special value would be the limb-bones of very young colts, in which the rudimentary toe-bones might be separate and more fully developed than in the adult. As matters already stand, a further inference may, however, be drawn from these rudimentary toes in the Shire Horse. As already stated, in many Horses the splint-bones

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terminate inferiorly in thin scale-like extremities. In some instances, however (as in the fore limb of Stockwell, exhibited in a wall-case), they have a small flat expansion at the lower end, and from the evidence of the Shire Horse bones these expansions may be definitely identified with the lateral toe-bones of the three-toed ancestors of the Horse. In a certain sense, therefore, a considerable number of existing Horses are really three-toed animals.

Whether the highly developed condition of the splint-bones and rudimentary toe-bones of the Shire Horse indicates an ancestry for that breed distinct from either the Arab thoroughbred stock on the one hand, and the ordinary North European stock on the other, or whether it is merely a kind of reversionary redundancy due to the large size and vigour of the Shire, is difficult to decide.

Variation of another type has formed the subject of a paper by Mr. O. C. Bradley in the *Proceedings* of the Edinburgh Physical Society. The trapezium of the carpus of the Horse is the structure discussed; and it is shown that this bone is present, either in one or both limbs, in about 50 per cent. of the skeletons examined, while if each carpus be taken separately (that is, without reference to the condition in its fellow) the percentage is a little more than 40. This, in conjunction with its minute size, leads to the conclusion that in the evolution of the single-toed foot of the Horse the bone in question is following in the steps of the lateral metacarpal (splint-bone) with which it was originally connected.

Variation in the Shape of the Hoef in the Horse Family.

Another point of interest is the existence of a considerable amount of difference in the structure of the hoof in the various members of the Horse tribe; this being illustrated by a series of specimens (N.H. **81–89**) in the large case on the north side of the North Hall. In the Horse (*Equus caballus*) the "frog," or central cushion is reduced to a narrow ridge, deeply grooved posteriorly, which does not extend behind the case of the hoof, and is not applied to the ground. In Grévy's Zebra (*E. grevyi*), of North-east Africa, the frog becomes much broader, with scarcely any trace of the groove, and its hind part touches the ground. In the Kiang (*E. hemionus kiang*), of Tibet, the posterior development of the frog becomes more marked, so that a considerable portion projects behind the case of the hoof and

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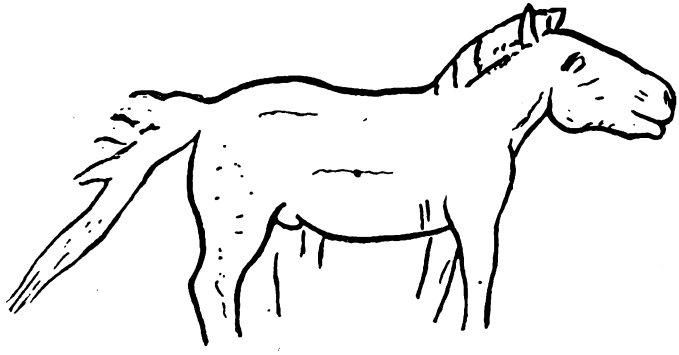
Fig. 12.



The Cave-Horse: from a Prehistoric Sketch.

Fig. 13.

Skull of the Mongolian Wild Horse, Female (No. N. H. 16).

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touches the ground; the cleft being narrow and deep. A still greater development of the hind part of the frog occurs in the Ass (*E. asinus*). In the extinct South American *Onohippidium* the frog is somewhat intermediate between the Horse and the Ass type, being grooved and not projecting behind the case of the hoof, but being of considerable breadth and thickness. In the Bonte-Quagga or Burchell's Zebra (*Equus burchelli*) of South and Eastern Africa the medium-sized and slightly cleft frog is deeply sunk in the hoof, behind which it projects to a small degree; not touching the ground, except when the hoof is much worn.

Characteristics of the Horse. Coming to the characteristics of the Horse itself, as typified by the domesticated Scandinavian breed, the species is distinguished by the tail being abundantly covered with long hair up to the root and the general presence of bare callosities or, "chestnuts," on the inner side of both pairs of limbs. The mane, which has a forelock on the forehead, is long and pendant, the ears are relatively short, the head small, the limbs long, and the hoofs large and broad, especially the front pair, which considerably exceed the hind ones in this respect. Normally there are no distinct colour-markings; although dark bars are not unfrequently seen on the legs, and more rarely on the shoulders, of dun-coloured individuals.

This definition requires, however, some amount of modification when the wild representatives of the species are taken into consideration. The following main types or races of the Horse may be recognized, of which the first is :—

The Cave Horse. The Cave Horse, *Equus caballus spelæus*, a race typified by bones and teeth from the cavern of Bruniquel, Tarn-et-Garonne, France, described by Sir R. Owen in the *Philosophical Transactions of the Royal Society* for 1869, and exhibited in the Geological Department. It was then supposed to indicate an animal of about 13½ hands in height, but the relatively large size of the cheek-teeth of the next race indicates that it was probably much smaller. Prehistoric sketches from the Cave of La Madelaine, in the Dordogne, south of France (fig. 12), show that this race was practically identical with the living Wild Horse of Mongolia, having the same relatively large

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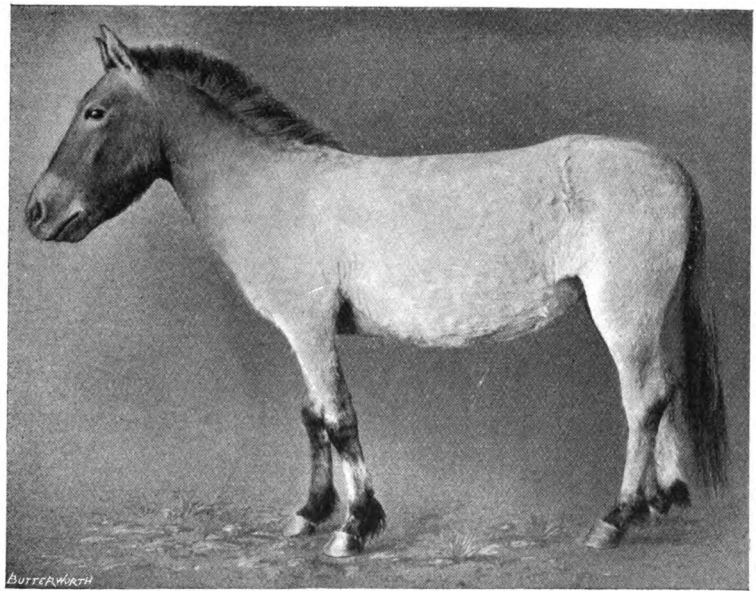
FIG. 14.



THE MONGOLIAN WILD HORSE.
(From the female specimen presented by the Duke of Bedford.)

FIG. 15.

THE DARLEY ARABIAN.
From the original picture at Aldby Park, York.

[*To face page* 14.

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to the Arab*. If this be admitted the Dun Pony should be called *Equus caballus typicus*.

These Ponies are evidently related to the Wild Mongolian Horse, but have a fuller development of the mane and tail, which are wholly black, although specimens may occasionally be seen in England in which the hairs on the root of the tail are shorter than usual. In some cases there is a dark stripe down the back and traces of barring on the legs. The facial portion of the head is longer, and the hoofs are relatively larger than in the Celtic Pony.

This breed may be regarded as probably derived from the Wild Mongolian Horse, and likewise as the main ancestral stock of the ordinary domesticated Horses of North-western Europe. In the skulls of ordinary domesticated Horses the cheek-teeth are, both absolutely and proportionately, much smaller than in the Wild Horse. When Arab blood is presumably absent, there is no trace of a distinct impression in front of the socket for the eye; and in some instances the facial portion of the skull is not markedly bent down on the basal axis. This bending-down of the face on the line of the basal axis may, however, occur in domesticated Horses of all breeds. Skulls exhibiting different degrees of development of this feature are shown in the case in the central arch of the north hall. One of these skulls was obtained from the Roman Fort at Newstead near Melrose, where specimens exhibiting various degrees of bending-down of the face were found (see J. C. Ewart, *Trans. Royal Society Edinburgh*, vol. xlv, 1907).

The relatively smaller head and still smaller cheek-teeth, the shorter ears, the presence of a fore-lock, the larger and pendent mane, the more fully haired tail, and the wider hoofs which distinguish the ordinary Horses of Western Europe from the Wild Horse may be regarded in all probability as due, at any rate to a great extent, to the effects of domestication, although there is also the possibility that they may in some degree be due

* See Stejneger, *op. cit.* p. 470, note. Osborn, on the other hand (*Bull. Amer. Mus.* vol. xxiii, p. 262, 1907), adopts the view here advocated, and uses the name *E. africanus*, Sanson for the Arab; this name is, however, preoccupied by *E. asinus africanus* of Fitzinger.

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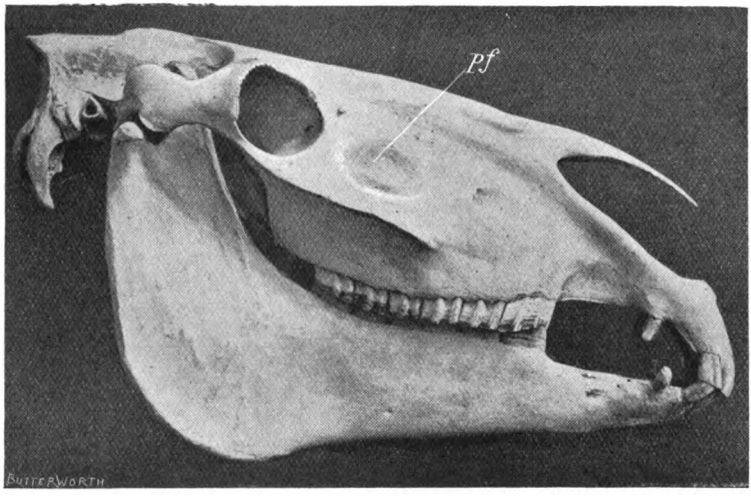
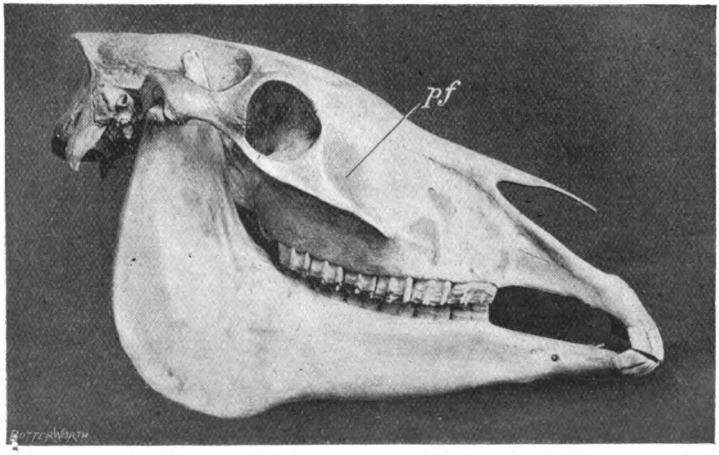
FIG. 17.



SKULL OF THE SHIRE STALLION "BLAISDON CONQUEROR" (No. N. H. 8).

FIG. 18.



SKULL OF AN ARAB MARE, SHOWING THE CHARACTERISTIC SINUOUS PROFILE. (From the specimen, No. N. H. 20, presented by W. Scawen Blunt, Esq.)

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He was winner of the Derby in 1880. His pedigree is as follows:—

- BEND-OR, 1877
  - Doncaster, 1870
    - Stockwell, 1849
      - The Baron, 1842
      - Pocahontas, 1837
    - Marigold, 1860
      - Teddington, 1848
      - Sister to Singapore, 1852
  - Rouge Rose, 1865
    - Thormanby, 1857
      - Windhound, 1850
      - Alice Hawthorn, 1838
    - Ellen Horne, 1844
      - Redshank, 1833
      - Delhi, 1838

The Collection also contains the skull of "Royal Hampton," a Thoroughbred stallion foaled in 1882, who died in 1906. He was winner of the National Breeder's Produce Stakes at Sandown Park in 1884, and of the City and Suburban Handicap, 1886. "Royal Hampton" was owned by Sir J. Blundell Maple, and the skull (N.H. **11**) was presented by Mrs. Ballard (Lady Maple) in 1906.

The following is the pedigree of this well-known Horse:—

- ROYAL HAMPTON, 1882
  - Hampton 1872
    - Lord Clifden, 1860
      - Newminster, 1848
      - The Slave, 1852
    - Lady Langden, 1868
      - Kettledrum, 1858
      - Haricot, 1847
  - Princess, 1872
    - King Tom, 1851
      - Harkaway, 1834
      - Pocahontas, 1837
    - Mrs. Lincoln, 1866
      - North Lincoln, 1856
      - King Alfred's Dam, 1856

The skull, in addition to showing the faint trace of a preorbital depression common to most Thoroughbreds, is noteworthy for retaining the characteristic sinuous Arab profile, which is always a character of Horses descended from "King Tom."

Another Thoroughbred stallion of which the skull (N.H. **12**) is exhibited is "Donovan," who was foaled in 1886 and died in February, 1905. He ran 21 races in 1888 and 1889, out of

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which he won 18. The skull was presented by the Duke of Portland in 1905. Donovan's pedigree is given below :—

- DONOVAN, 1886
  - Galopin, 1872
    - Vedette, 1854
      - Voltigeur, 1847
      - Daughter of, 1849
    - Flying Dutchess, 1853
      - Flying Dutchman, 1846
      - Merope, 1843
  - Mowerina, 1876
    - Scottish Chief, 1861
      - Lord of the Isles, 1852
      - Miss Ann, 1846
    - Stockings, 1863
      - Stockwell, 1849
      - Go-ahead, 1853

To show the characters of the Thoroughbred head, that of "Corrie Roy," a mare foaled in 1878, who died in 1901, is exhibited. She was the winner of the St. Ebor Handicap and the Manchester November Handicap, 1883. The head (N.H. **10**) was presented by Sir J. Blundell Maple, her owner, in 1901. The legs of the same mare are also exhibited, as a contrast to those of a Shire Cart-Horse.

Passing on to statuettes of Thoroughbreds, the first for mention is that of the celebrated English stallion "Persimmon" (N.H. **118**), owned by H.M. the King. "Persimmon" was foaled in 1893; his sire being "St. Simon," and his dam "Perdita II." He was winner of the Derby and the St. Leger in 1896, and of the Ascot Gold Cup and Eclipse Stakes in 1897. The statuette was presented by H.R.H. the Prince of Wales in 1905. Persimmon's pedigree is as follows :—

- PERSIMMON, 1893
  - St. Simon, 1881
    - Galopin, 1872
      - Vidette, 1854
      - Flying Duchess, 1853
    - St. Angela, 1865
      - King Tom, 1851
      - Adeline, 1851
  - Perdita II, 1881
    - Hampton, 1872
      - Lord Clifden, 1860
      - Lady Langden, 1868
    - Hermione, 1875
      - Young Melbourne, 1855
      - La Belle Heléne, 1866

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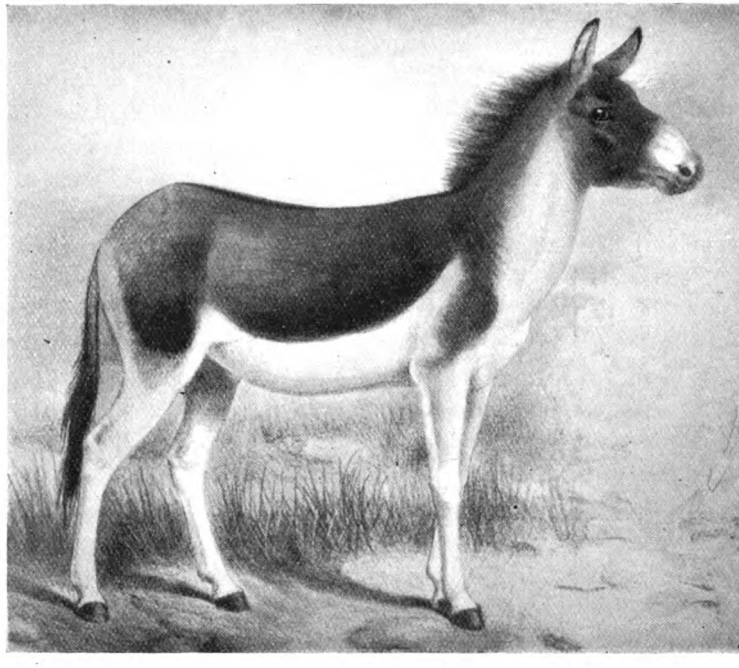
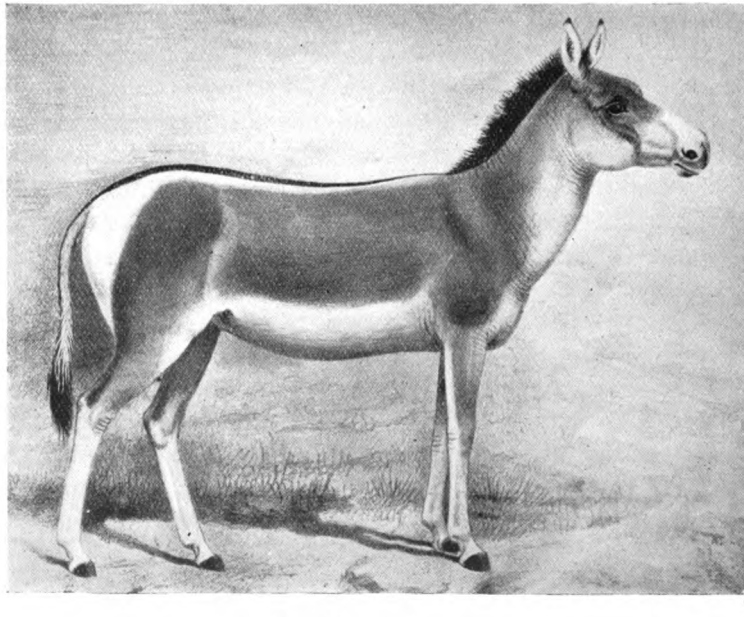
FIG. 19.



THE KIANG.
(Lydekker, *Proc. Zool. Soc.* 1904, vol. i, pl. xxviii.)

FIG. 20.



THE KOBDO ONAGER.
(Lydekker, *Novitates Zoologicæ*, vol. xl, pl. xvii.)

[*To face page* 28.

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or markedly sinuous; the tail-tuft is moderate, and the dark dorsal stripe is very broad, in some cases stopping short of the tail-tuft, and bordered, at least posteriorly, by a band of white or whitish, which joins the white on the buttocks and the back of the thighs. The upper-parts, in the summer coat, are usually some shade of pale reddish fawn or sandy (isabelline); while the light areas, which vary from pure white to whity brown, are much the same in extent as those of *E. hemionus*, but extend more on to the buttocks, and thence along the sides of the dorsal stripe, and in some cases occupy more of the body and head. In winter the long and rough coat becomes more or less decidedly grey, and in one race is distinctly mouse-grey with sharply defined white areas.

The cry of the Indian Ghor-khar is a "shrieking bray," and therefore not unlike that of the Kiang; but in the case of the Syrian Onager, and probably also in that of the true Onager, it is stated to be more like that of the Ass, to the wild forms of which the species approximates in its narrow hoofs, broad dorsal stripe, small tail-tuft, and grey colour of the winter coat in at least one local race.

The Onager appears to be represented in a Prehistoric sketch incised on a fragment of Reindeer antler discovered in the cave of Kesslerloch, Schaffhausen.

No specimen of this species is at present exhibited.

Of the local races of this species, the first is the Indian Ghor-khar (*Equus onager indicus*) of the deserts of Sind, Kach, and Baluchistan. The height at the shoulder reaches 11½ hands, and the profile of the face is straight. The general colour of the upper-parts is sandy in summer, with the light band on each side of the dorsal stripe narrow, ill-defined, and whitey-brown in colour, and the white on the rump not pure. The broad dorsal stripe does not reach the tail-tuft.

The second race is the Kobdo Onager (*Equus onager castaneus*, fig. 20), from Kirghis-Nor, Kobdo, in Western Mongolia, characterised by the straight profile of the face, the rufous isabella hue of the summer coat, the full mouse-grey colour of the winter coat, the large amount of pure white on the buttocks, and the distinctness of the pure white band on each side of the dorsal stripe, which extends quite down to the tail-tuft. The broad chocolate-coloured dorsal

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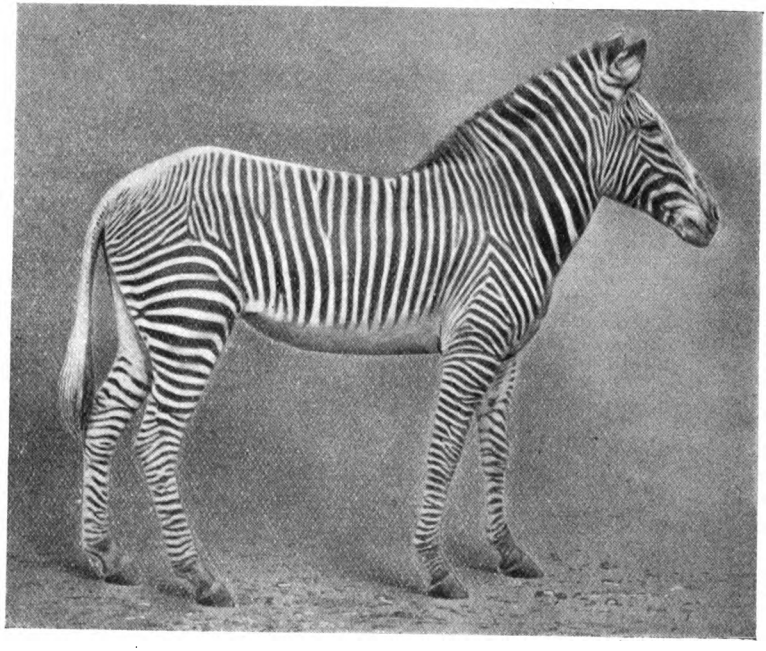
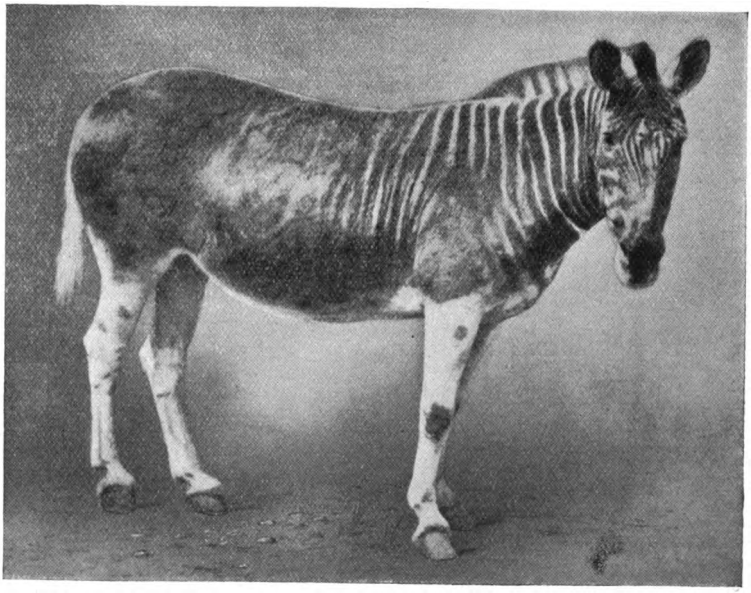
FIG. 21.



GRÈVY'S ZEBRA.

FIG. 22.



THE QUAGGA.
(From a photograph of a living specimen.)

[*To face page 32.*

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on the forehead, the whole animal is barred transversely with reference to the lines of its spine and limbs.

It is also stated that the Asses of the deserts of North-East Africa are perfectly adapted to their surroundings in colour, and no one can doubt that the assimilation is equally perfect in the case of the Kiang and the Wild Horse of Central Asia. In the matter of colouring the Kiang recalls the Quagga, despite a difference in the deepness of the brown pervading the upper-parts in the two species. Notwithstanding this difference, there seems no question that the explanation of the significance of the colouring of the Kiang applies with equal truth to the Quagga. This explanation is the action of light and shade.

In the Kiang it will be noticed that the upper-parts, on which the light falls, are of a rich ruddy hue, darker than ordinary sand, while the muzzle, the lower side of the head, the throat and under-parts are creamy white; an arrangement which must render it practically invisible when standing in the desert at a distance. The white limbs and backs of the thighs may be explained as follows:—When a Kiang lies down, with the hind-quarters depressed, the fore-legs folded and the hind-legs tucked in close to the body, the white on the back of the thighs is brought into line with that of the belly, and a continuous expanse of white, obliterating the shadow, extends all along the underside from the knee to the root of the tail. The same is the case with the Quagga and the under-mentioned Bonte-Quagga; and it indicates, in the case of the latter, the meaning of the change in pattern presented by the different local races as we pass from Somaliland southwards into Cape Colony. In correlation with the adoption of a life in the open, a new method of concealment by means of shadow counteraction was required, and was perfected by the toning down of the stripes on the upper side and the suppression of those on the hind-quarters, legs, and under-parts.

Burchell's Zebra, or Bonte-Quagga. Although the typical southern race of the exceedingly variable species known as *Equus burchelli* is commonly called Burchell's Zebra, it is much better designated by its Boer title of Bonte-Quagga (*i. e.* Painted Quagga), since this obviates the use of such incon-

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venient names as "Chapman's Burchell's Zebra." The species is very closely allied to the Quagga, from which perhaps it is not really separable; but the stripes are always well developed on the hind-quarters, where they present the characters mentioned under the heading of that animal. The species displays remarkable variation in colouring and markings as we proceed from south to north; the typical southern race (fig. 23) having dark brown stripes with intervening brown "shadow-stripes" on an orange ground, and unstriped legs, whereas in the northern race (fig. 24) the stripes, which are black on a white ground, extend down to the hoofs, and have no intervening shadow-stripes.

In all cases the upper extremities of some five or six stripes on the hind half of the body are bent backwards parallel to the dorsal stripe; while the light area between these body-stripes and the dorsal stripe is continued to the root of the tail, and is not crossed by transverse bars, but traversed longitudinally by the backward extension of at least one of the body-stripes.

The typical Burchell's Bonte-Quagga, or Burchell's Zebra (*Equus burchelli typicus*, M. **1818**, fig. 23), now nearly, if not completely, extinct as a wild animal, formerly inhabited British Bechuanaland and some of the adjacent districts in enormous droves. In this race the ground-colour is orange, and the shadow-stripes on the hind-quarters are very strongly marked, and narrower than the main stripes, which are themselves broader than the light interspaces containing the shadow-stripes. The hind-quarters have only a few short stripes below the long stripe running to the root of the tail; the body-stripes stop short on the sides of the under-parts, so as to be widely separated from the longitudinal ventral stripe; and, with the occasional exception of a few on the knees and hocks, the legs are devoid of stripes, as are usually the sides of the tail.

This race is represented by a specimen from the Orange River Colony, the gift of the Hon. Walter Rothschild.

The next race (and only some of the more important ones are here referred to) is the Damaraland Bonte-Quagga (*E. burchelli antiquorum*) in which stripes are developed above the knees and hocks, but none (or very few) below. It is unrepresented in the exhibited series.

With the Zulu Bonte-Quagga (*E. burchelli wahlbergi*) we

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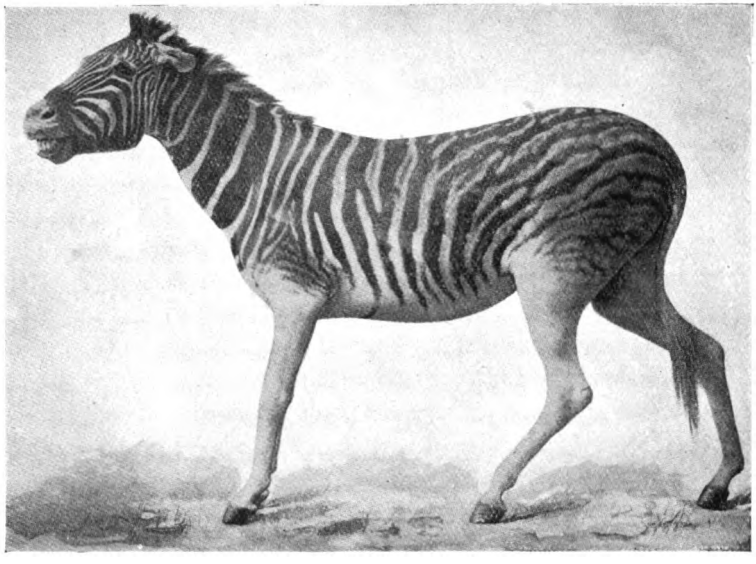
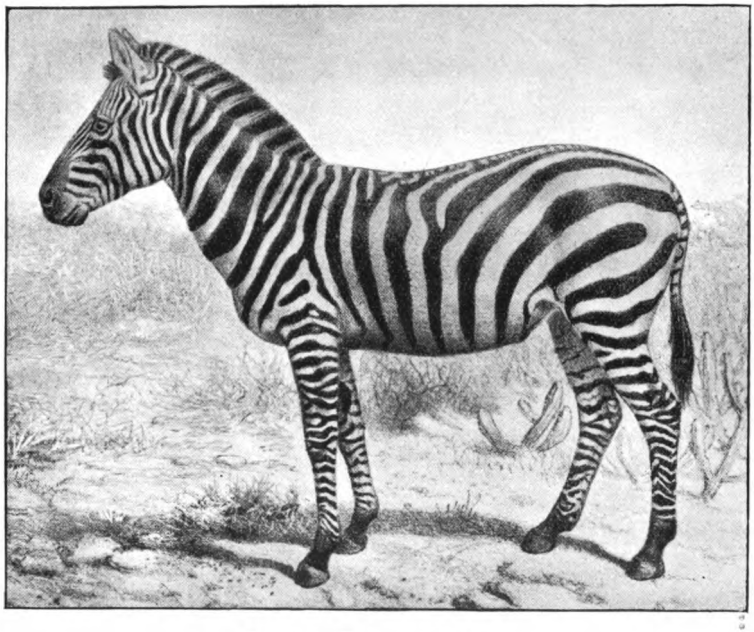
FIG. 23.



THE BONTE-QUAGGA OR BURCHELL'S ZEBRA. Typical Race.
(Lyon, *Proc. U. S. Nat. Mus.*, vol. xxxii, pl. i.)

FIG. 24.



GRANT'S BONTE-QUAGGA.
(Sclater, *Proc. Zool. Soc.*, 1901, vol. ii, pl. xxix.)

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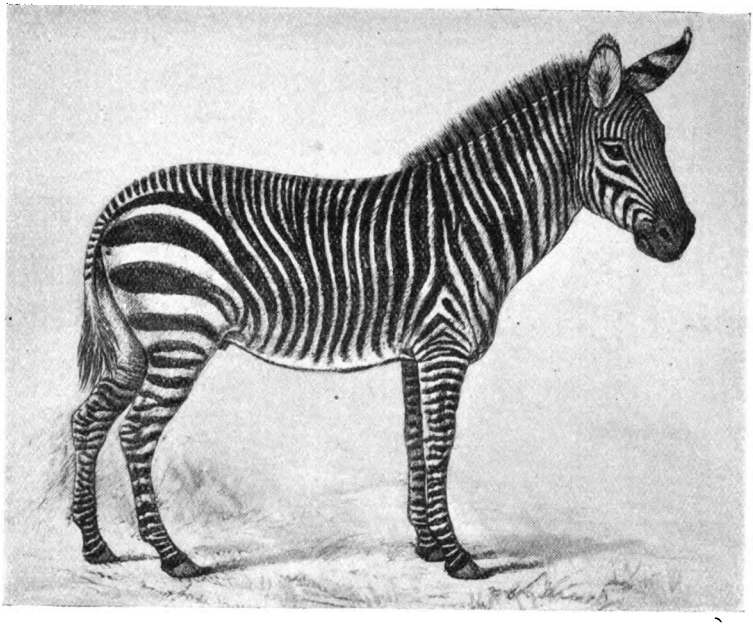
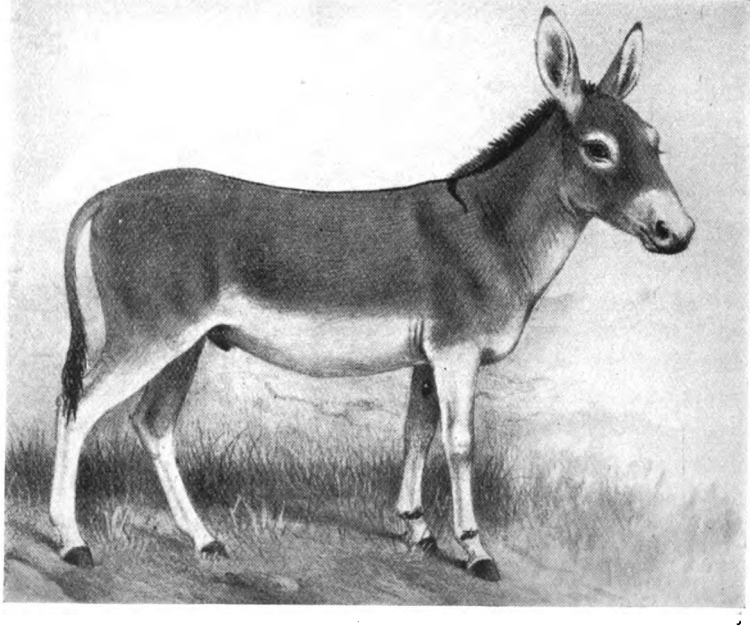
FIG. 25.



THE MOUNTAIN ZEBRA.

FIG. 26.



THE NUBIAN WILD ASS.
(Lydekker, *Novitates Zoologicæ*, vol. xi, pl. xx.)

[*To face page* 38.

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Other Zebras. In the *Proceedings* of the Zoological Society of London for 1904 (p. 181) Prof. J. C. Ewart described a Zebra, probably from the district between the upper part of the Tana River and Lake Rudolf, resembling *E. zebra* in height, the form and size of the head, ears, and muzzle, in the characters of the mane, tail, and hoofs, and also in the gridiron-pattern of the rump-stripes. It differs from that species in the backward inclination of the hairs of the broad dorsal stripe, and in certain details of striping and colour; the ground-colour being rich cream. The name of Ward's Zebra was suggested for this animal.

In the same Journal for 1906 (p. 691) the Hon. Walter Rothschild described, as *Equus annectans*, a Zebra from N. E. Rhodesia distinguished by its narrow white stripes and broad black stripes extending from behind the ears to the root of the tail. The longitudinal stripes, which extend from the root of the tail more towards the shoulder than in any other Zebra, are united to the transverse stripes, instead of being broken, as in most races of the Bonte-Quagga. In the absence of chestnut on the face it resembles *E. burchelli selousi*. The head, limbs, and tail are evenly marked with narrow white stripes on a black ground; and the ears are also strongly striped. The skull is stated to be intermediate between that of the Zebra and that of the Bonte-Quagga. Another Zebra, from German East Africa, has been named by Dr. P. Matschie (*Weidwerk in Wort und Bild*, 1906, p. 236) as *Hippotigris muansæ*.

The Ass. The last of the living representatives of the Horse family is the Ass (*Equus asinus*), which in a domesticated condition, is found almost throughout the habitable world, and as a wild animal in North-eastern Africa, south of the Tropic, from Upper Nubia to Somaliland. It is the only Wild Ass found within the tropics, and the only one which is completely grey at all seasons of the year. The typical form of the species appears to be the Domesticated Ass of North-western Europe.

The bodily size in the wild state is medium or large, the height at the shoulder ranging from 3 ft. 9½ in. to 4 ft. 1 in. The ears are very long, the hoofs small and narrow, with no marked

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superiority in the size of the front pair; while the tail-tuft is moderate, and there is no trace of a fore-lock. The dark dorsal stripe is narrow, and in some cases discontinuous, not reaching the tail-tuft, and being without white borders. Either a shoulder-stripe or dark barrings on the legs, or both together (in the domesticated race), are present, and there is no dark ring above the hoofs. There is a distinct white ring round the eye, but no white on the buttocks or rump. The general colour of the upper-parts is at all seasons pure or tawny grey-fawn; the muzzle, a ring round each eye, the under surface of the lower jaw, the inside of the ear, the under-parts, and the inner surface and much of the lower portion of the legs, being pure white. Apparently there is no marked (if any) difference, either in colour or length, between the summer and the winter coat. The cry is a bray.

There are two wild races of the species, namely the Nubian Wild Ass (*Equus asinus africanus*, M. **1014**, fig. 26) inhabiting North-eastern Africa, that is to say Senaar and Nubia; its range formerly extending as far as the fifth cataract of the Nile, and eastwards to the River Atbara and the Danakil district, but not including Abyssinia. It is half-wild in Socotra. Year by year the range of this race appears to become more and more restricted; and unless measures be taken for its protection, there is danger that it may be exterminated. The race is characterised by its generally inferior size (ranging from about 8 ft. 9½ in. to 3 ft. 11½ in.) as compared with the Somali race, the generally greyish fawn-colour, the continuous, although very narrow dorsal stripe, the presence of a short shoulder-stripe, and of a dark patch on each side of the front fetlock, and the absence of distinct dark barrings on the legs.

It is represented in the lower mammal gallery by a male specimen (M. **1014**) from Nakheila, on the Atbara River, presented by the Hon. Charles N. Rothschild in 1904, and also by the head of a female from Yalalub, Eastern Sudan, given by Mr. H. W. Haig.

A small breed of Nubian Wild Asses inhabits the island of Socotra. These Asses, which appear to have been originally imported from the mainland, stand only about 3½ feet at the shoulder. They are characterised by perfect similarity in colour

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and markings, the nose, a wide ring round the eye, as well as the chest and belly, being white, and the legs nearly so, thus contrasting strongly with the mouse-coloured head and back. The black stripes on the shoulder and down the middle of the back, and a few somewhat irregular dusky rings round the legs, are also clearly defined.

The second, or Somali, race (*Equus asinus somaliensis* M. **1015**), ranges from Somaliland, through Danakil and Gallaland, to the Red Sea. It is distinguished from the Nubian race by its superior size, the pale and more greyish colour, the absence of a shoulder-stripe, the slightly developed and discontinuous dorsal stripe, and the presence of a number of distinct black bars on the legs, and of a brownish patch on the front of each foot above the hoof. The head and ears are also relatively shorter, with less black on the front of the tips, the mane is longer and inclined to be pendent; and the white round the eye and on the muzzle is less pure and less sharply defined from the fawn, while there is no white on the under side of the lower jaw and the angle of the throat.

It is represented in the exhibited collection by a mounted male specimen (M. **10**) presented by Gen. Sir A. H. Fitzroy Paget in 1893.

The Domesticated Ass is undoubtedly the direct descendant of one or both of the wild races; and, unlike the Horse, exhibits very little variation from the ancestral type; such modifications as do exist being restricted to colour and size. The colour variations consist of a tendency to albinism on the one hand, and melanism on the other; the extremes being represented respectively by white and by black Asses. As regards size, the extreme modification is represented by the Dwarf Ass of India and Ceylon, which does not stand more than about two feet at the shoulder.

In Egypt the Ass was known in a domesticated state long previous to the Horse; and a skull from an Egyptian tomb (N. H. **24**), presented in 1900 by Professor Flinders-Petrie, is exhibited in the large Horse case in the north hall. The only other specimens illustrating this species are two skulls (N.H. **26**, **27**) male and female, from Aden, presented by the Royal Society in 1899.

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